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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,918	12/14/2001	Wei-Ge Chen	3382-61344	3901

26119 7590 07/14/2006

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EXAMINER	
PIERRE, MYRIAM	

ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/016,918	CHEN ET AL.
	Examiner	Art Unit
	Myriam Pierre	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, 9-15 and 21-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Smyth et al. (5,974,380).

As to claim 1, Smyth et al. teach

In a transform-based audio encoder, a method of dynamically selecting between joint channel coding and independent channel coding of a multi-channel input audio signal, the method comprising: for a portion of the multi-channel input audio signal, measuring disparity (estimation difference) between excitation patterns (energy) of individual channels (transient status) of the multi-channel input audio signal (col. 19 lines 14-17; col. 16 lines 42-46; col. 7 lines 26-28 and 33-35 and col. 6 lines 65-67; the global bit management (GBM) allocates bits between subbands within a channel and decides which subband channel will be joint based on threshold frequency or psychoacoustic masking of individual subbands in each frame, bits are allocated based on estimation differences from a predictor; the transient status is based on the ratio of the energy or excitation);

determining whether to encode the portion using joint channel coding or independent channel coding based at least in part on the measured disparity (estimation difference) (col. 24 lines 38-41; col. 7 lines 11-21 and col. 6 lines 65-67; the global bit management (GBM) decides

which subband channel will be joint based on threshold frequency or psychoacoustic masking of individual subbands in each frame, the estimation difference is calculated in order to allocate bits) and

encoding the portion using the determined joint channel coding or independent channel coding (col. 9 lines 40-46; col. 24 lines 38-41; and Fig. 5 elements 73-74; decision is made, depending on fixed or unfixed data, which will be joint coded and or vector quantized, VQ).

As to claim 2, which depends on claim 1, Smyth et al. teach

for the portion of the multi-channel input audio signal, measuring energy separation between coding channels for joint channel coding and those for independent channel coding (col. 19 lines 5-8 and 16-20 and col. 9 lines 40-45; and col. 14 lines 18-24); and

determining to encode the portion using joint channel coding or independent channel coding based also at least in part on the measured energy separation between said coding channels for joint channel coding and for independent channel coding (col. 19 lines 5-8; 16-20; col. 9 lines 40-45 and col. 24 lines 38-41).

As to claim 3, which depends on claim 1, Smyth et al. teach

wherein measuring the disparity between excitation patterns of individual channels comprises determining a ratio of aggregate excitation measures of the individual channels of the multi-channel input audio signal (col. 19 lines 16-21 and col. 23 lines 11-21).

As to claim 4, which depends on claim 1, Smyth et al. teach

wherein measuring the disparity between excitation patterns of individual channels comprises determining a ratio of expected noise-to-excitation ratio measures of the individual channels of the multi-channel input audio signal (col. 12 lines 30-35 and col. 23 lines 11-21).

As to claim 5, which depends on claim 1, Smyth et al. teach

wherein said measuring and determining comprise: determining a ratio of aggregate excitation measures of the individual channels of the multi-channel input audio signal (col. 12 lines 30-35); and determining not to encode the portion using joint channel coding if the ratio exceeds a threshold (col. 7 lines 13-20).

As to claim 6, which depends on claim 1, Smyth et al. teach

wherein said measuring and determining comprise: determining a ratio of expected noise-to-excitation ratio measures of the individual channels of the multi-channel input audio signal (col. 12 lines 30-35); and determining not to encode the portion using joint channel coding if the ratio exceeds a threshold (col. 7 lines 13-20 and col. 17 lines 1-9).

As to claim 7, which depends on claim 1, Smyth et al. teach

comprising determining not to encode the portion using joint channel coding if a ratio of an excitation pattern-based measure of individual channels of the multi-channel input audio signal exceeds a first threshold (col. 12 lines 30-35), and a smaller of the excitation pattern-based measures does not exceed a second threshold (col. 7 lines 13-20 and col. 17 lines 1-9).

As to claim 9, which depends on claim 1, Smyth et al. teach

A data-carrying medium having a compressed audio stream produced by the method of claim 1 carried thereon (col. 12 lines 53-63).

As to claim 10, Smyth et al. teach

a multi-channel transformation component operative to perform a multi-channel transformation on multiple individual channels of a multi-channel audio input signal to produce joint coding channels (col. 9 lines 40-47);

a transform-based encoding component operative to encode multiple coding channels into a compressed data stream (col. 22 lines 45-50);

an excitation pattern disparity measuring component operative to produce a excitation pattern disparity measure of disparity in excitation patterns between channels (col. 19 lines 14-17; col. 16 lines 42-46; col. 7 lines 26-28 and 33-35 and col. 6 lines 65-67; the global bit management (GBM) allocates bits between subbands within a channel and decides which subband channel will be joint based on threshold frequency or psychoacoustic masking of individual subbands in each frame, bits are allocated based on estimation differences from a predictor; the transient status is based on the ratio of the energy or excitation); and

a channel coding mode selecting component operative to select between a joint channel coding mode in which the transform-based encoding component encodes the joint coding channels into the compressed data stream and an independent channel coding mode in which the transform-based encoding component encodes the individual channels of the multi-channel audio input signal, the channel coding selection component basing said selection at least in part upon

the excitation pattern disparity measure (col. 14 lines 20-25; col. 9 lines 40-45 and col. 23 lines 3-7).

As to claim 11, which depends on claim 10, Smyth et al. teach

an channel energy separation measuring component operative to produce a channel energy separation measure of energy separation between the joint coding channels and the individual channels (col. 9 lines 40-46; col. 14 lines 18-22; and col. 18 lines 62-67); and

the channel coding mode selecting component further basing said selection also at least in part on the channel energy separation measure (col. 19 lines 5-8).

As to claim 12, which depends on claim 10, Smyth et al. teach

wherein the excitation pattern disparity measuring component operates to produce the excitation pattern disparity measure as a ratio of aggregate excitation measures of the individual channels of the multi-channel input audio signal (col. 19 lines 16-20).

As to claim 13, which depends on claim 10, Smyth et al. teach

wherein the excitation pattern disparity measuring component operates to produce the excitation pattern disparity measure as a ratio of expected noise-to-excitation ratio measures of the individual channels of the multi-channel input audio signal (col. 12 lines 30-35).

As to claim 14, which depends on claim 10, Smyth et al. teach

wherein the channel coding mode selecting component determines not to encode a

portion of the multi-channel audio input signal with the joint channel coding mode if the excitation pattern disparity measure exceeds a threshold (col. 23 lines 11-21).

As to claim 15, which depends on claim 10, Smyth et al. teach

wherein the channel coding mode selecting component determines not to encode a portion of the multi-channel audio input signal with the joint channel coding mode if the excitation pattern disparity measure exceeds a minimum disparity threshold (col. 23 lines 11-21), and a smaller excitation pattern of the individual channels exceeds; a minimum excitation threshold (col. 23 lines 18-21).

As to claim 21, Smyth et al. teach

In a transform-based audio encoder, a method of encoding a multi-channel audio input signal, the method comprising:

performing a multi-channel transformation on multiple input channels of the multi-channel audio input signal to produce a plurality of joint coding channels (col. 9 lines 40-46; and col. 22 lines 53-58);

selectively suppressing at least one of the joint coding channels as a function of at least quality of reproduction, rate control buffer fullness, and channel separation (col. 12 lines 55-63; col. 10 lines 5-10 and 14-17); and

encoding the multi-channel audio input signal with said selective suppression of said at least one joint coding channel (col. 9 lines 40-45 and col. 12 lines 55-60).

As to claim 22, which depends on claim 21, Smyth et al. teach

wherein the selectively suppressing comprises scaling the at least one joint coding channel by a scaling factor having a value varying based on a current average level of quality, current rate control buffer fullness and amount of channel separation (col. 12 lines 55-60 and col. 10 lines 5-10 and 14-17).

As to claim 23, which depends on claim 22, Smyth et al. teach

further comprising measuring the current average level of quality as a noise-to-excitation ratio for a portion of the multi-channel audio input signal (col. 12 lines 30-35).

As to claim 24, which depends on claim 21, Smyth et al. teach

wherein the selectively suppressing the at least one joint coding channel is also a function of a rate setting of the transform-based audio encoder (col. 22 lines 42-51 and col. 12 lines 55-60).

As to claim 25, which depends on claim 21, Smyth et al. teach

A data-carrying medium having a compressed audio stream (col. 12 lines 55-60).

As to claim 26, Smyth et al. teach

A transform-based audio encoder for multi-channel audio signals, comprising:

a multi-channel transformer operating to convert multiple individual channels of an input multi-channel audio signal into joint channels via a multi-channel transformation (col. 9 lines 40-46; and col. 22 lines 53-58);

a channel suppressor operative to selectively suppress at least one of the joint channels based on at least one suppression parameter, wherein the suppression parameters comprise values of a current quality of audio reproduction, a current rate buffer fullness, and a current channel separation (col. 12 lines 55-60 and col. 10 lines 5-10 and 14-17); and

an inverse transformer operating to convert the joint channels via an inverse of the multi-channel transformation to produce a re-matrixed multi-channel audio signal (col. 48 lines 45-50).

As to claim 27, which depends on claim 26, Smyth et al. teach

a quality analyzer operating to calculate a noise-to-excitation ratio value of the audio signal, and to provide the calculated noise-to-excitation ratio value as the value of the current quality of audio reproduction to the channel suppressor (col. 12 lines 30-35 and 55-60).

As to claim 28, Smyth et al. teach in a transform-based audio encoder, a method of improving coding efficiency, the method comprising:

converting a block of samples of an input signal into a plurality of transform domain coefficients (col. 19 lines 16-20);

quantizing the transform domain coefficients according to quantization step-size values of quantization bands for the transform domain coefficients (col. 19 lines 16-20 and col. 12 lines 55-60);

identifying any quantization bands of transform domain coefficients that are quantized to zero (col. 20 lines 40-47);

modifying the quantization step-size value of said any identified quantization bands to encode in fewer bits in a quantization matrix (col. 48 lines 45-50); and

encoding the quantization step-size values of the quantization bands in the quantization matrix (col. 12 lines 55-60).

As to claim 29, which depends on claim 28, Smyth et al. teach

further comprising: performing band truncation causing transform domain coefficients of at least some quantization bands to quantize to zero (col. 20 lines 40-47).

As to claim 30, which depends on claim 28, Smyth et al. teach

for any identified quantization band: selecting a modified value that is represented in fewer bits than the respective identified quantization band's original quantization step-size value when encoded in the quantization matrix (col. 12 lines 55-60); and

modifying the quantization step-size value for the respective identified quantization band to the modified value for encoding in the quantization matrix (col. 16 lines 41-49 and 52-55).

As to claim 31, which depends on claim 28, Smyth et al. teach

wherein the encoding comprises differential coding of the quantization step-size values in the quantization matrix (col. 12 lines 55-60).

As to claim 32, which depends on claim 28, Smyth et al. teach

wherein the modifying comprises setting the quantization step-size values of said any identified quantization bands to a same value, whereby differential coding of the modified quantization step-size values in the quantization matrix takes fewer bits (col. 16 lines 24-29 and 53-55; and col. 15 lines 46-51).

As to claim 33, which depends on claim 28, Smyth et al. teach

wherein the modifying comprises setting the quantization step-size values of said any identified quantization bands to a quantization step-size value of a non-identified quantization band, whereby differential coding of the modified quantization step-size values in the quantization matrix takes fewer bits (col. 16 lines 24-29 and col. 24 lines 33-35).

As to claim 34, which depends on claim 28, Smyth et al. teach

A data-carrying medium having a compressed audio stream (col. 12 lines 55-60).

As to claim 35, Smyth et al. teach a transform-based audio encoder, comprising:

a frequency domain transformer for converting blocks of input audio signal samples to frequency domain coefficients (col. 22 lines 53-58);

a quantizer for quantizing the transform domain coefficients according to quantization step-sizes of quantization bands for the transform domain coefficients (col. 12 lines 55-60 and col. 22 lines 55-58); and

a quantization matrix encoder for encoding a quantization matrix in a header for a frame of the input audio signal, the encoding comprising encoding the quantization step-sizes of the quantization bands in the quantization matrix, the quantization matrix encoder further operating to identify any quantization bands with zeroed transform coefficients (col. 18 lines 23-27; col. 31 lines 41-48) and

to modify the quantization step-size of such identified quantization bands (col. 16 lines 52-55) to encode with fewer bits in the quantization matrix in the header (col. 31 lines 41-48).

As to claim 36, which depends on claim 28, Smyth et al. teach

further comprising: a band truncator for selectively zeroing transform domain coefficients of a portion of the quantization bands (col. 18 lines 23-30 and col. 12 lines 55-60).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Minde (6,393,392).

As to claim 20, Minde teaches a transform-based audio encoder with improved band truncation, comprising:

an open-loop band truncator operating to select a first selection of transform domain coefficients for band truncation based on a target quality setting for an input audio signal (col. 10 lines 66-67; col. 7 lines 24-34);

a quality analyzer operative to analyze the input audio signal as encoded with band truncation using the first selection to produce an achieved quality measurement (col. 8 lines 36-41);

a closed-loop band truncator operating to select a second selection of transform domain coefficients for band truncation based on the achieved quality measurement (col. 9 lines 65-67; col. 10 lines 66-67; Fig. 19 step B1 and col. 3 lines 19-21); and

a transform encoder operative to encode the input audio signal with band truncation using the second selection (col. 7 lines 60-65 and col. 8 lines 36-41; $s_1(n)$ is the first selection and $s_2(n)$ is the second selection).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smyth et al. (5,974,380) in view of Minde (6,393,392).

As to claim 8, which depends on claim 1, Smyth et al. fails to teach a method of

dynamically selecting between joint channel coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process.

However, Minde does teach a method of dynamically selecting between joint channel coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process (col. 10 lines 66-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Smyth et al.'s joint channel coding into the method performed as an open loop process of Minde, because Minde teach that this would provide a less complex, sub-optimal method for mutli-channel encoding (Minde col. 9 lines 65-67 and col. 10 lines 66-67).

As to claim 16, Smyth et al. teach in a transform-based audio encoder, a method of improved band truncation, the method comprising:

performing a transform on a portion of an input audio signal to produce a set of transform domain coefficients (col. 22 lines 53-58 and col. 23 lines 5-8);

selecting as a process a portion of the transform domain coefficients for band truncation as a function of a target quality measurement (col. 23 lines 12-18);

suppressing the selected portion of the transform domain coefficients from encoding in a compressed audio data stream (col. 23 lines 17-21).

Smyth et al. fails to teach a method of dynamically selecting between joint channel coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process.

However, Minde does teach a method of dynamically selecting between joint channel

coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process (col. 10 lines 66-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Smyth et al.'s joint channel coding into the method performed as an open loop process of Minde, because Minde teach that this would provide a less complex, sub-optimal method for mutli-channel encoding (Minde col. 9 lines 65-67 and col. 10 lines 66-67).

As to claim 17, which depends on claim 16, Smyth et al. teach

wherein the target quality measurement is a target noise-to-excitation ratio for the input audio signal (col. 12 lines 30-35).

As to claim 18, which depends on claim 16, Smyth et al. teach

measuring an achieved quality measurement of the input audio signal encoded with the selected portion of the transform domain coefficients suppressed (col. 22 lines 53-58);

a second portion of the transform domain coefficients for second band truncation as a function of the achieved quality measurement (col. 19 lines 43-51);

suppressing the selected second portion of the transform domain coefficients from encoding in a second compressed audio data stream (col. 19 lines 50-51).

Smyth et al. fails to teach a method of dynamically selecting between joint channel coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process.

However, Minde does teach a method of dynamically selecting between joint channel

coding and independent channel of a multi-channel input audio signal , wherein said method is performed as an open loop process (Fig. 18 step B1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Smyth et al.'s joint channel coding into the method performed as an open loop process of Minde, because Minde teach that this would provide a less complex, sub-optimal method for mutli-channel encoding (Minde col. 9 lines 65-67; col. 10 lines 66-67; Fig. 19 step B1 and col. 3 lines 19-21).

As to claim 19, which depends on claim 16, Smyth et al. teach a data-carrying medium having a compressed audio stream (col. 12 lines 53-63).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. see PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Myriam Pierre whose telephone number is 571-272-7611. The examiner can normally be reached on 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

7/3/06

MP

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER